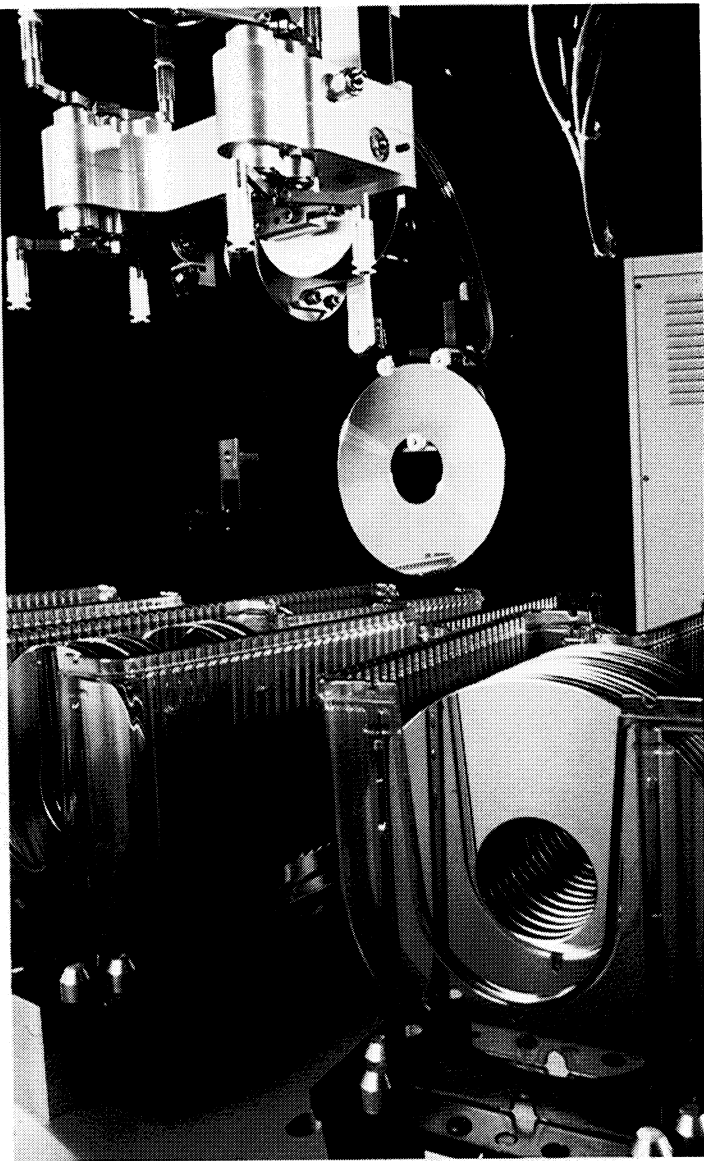


Tangleproof Coupling

For use in a satellite, Marshall Space Flight Center developed a unique rotary coupling capable of connecting a large number of electrical cables to a turntable without stressing the cables or tangling them. The device accommodates 246 cables and allows the turntable to rotate through an arc of 320 degrees. At the extremes of rotation, the cables remain loose enough so that they are not pulled taut and overstressed; at halfway rotation, the cables are not so loose that they tangle. The rotary connector was developed to carry electrical signals to and from a telescope platform on the satellite without employing a complex set of slip rings, which are electrically noisy and could have caused signal interference.

Details of this technology were described in an issue of NASA *Tech Briefs*, a publication intended to let potential users know what NASA-developed technologies are available for transfer (see page 118). Engineer Eugene F. Duval, then with Phase 2 Automation, a Palo



Alto, California company manufacturing robotic systems for industry, saw a use for the tangleproof rotary coupling technology; he applied the basic concept in designing connections for multiple hoses and wires in a robot manipulator joint. The joint is part of a proprietary gripper in Phase 2 Automation's CAS-100 Certifier Automation System for handling rigid disc media. The gripper is a high efficiency device for transferring discs to and from cassettes and disc testing machines; it is shown above

holding the doughnut-shaped disc. The tangleproof coupling, normally not visible because it is inside the robot arm, is the tiny device between the fingers of the hand in the top right photo, shown in closeup at right above. ▲

